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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KERNS, KEVIN P

ART UNIT PAPER NUMBER

1725

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/009,783

Applicant(s)

FILIPPI ET AL.

Examiner

Kevin P. Kerns

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 1-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/17/01 & 4/12/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The abstract of the disclosure is objected to because the legal term "comprises" (in the 2<sup>nd</sup> line) should be changed to "includes". Correction is required. See MPEP § 608.01(b).
2. The disclosure is objected to because of the following informalities: on page 20, line 21, "1" should be changed to "11" after "duct". In addition, there are numerous European spellings of terms (e.g. vaporisation, realise etc.) throughout the specification. Corrections and/or clarifications are required for these and any spelling/grammatical errors that occur throughout the specification.

### ***Claim Objections***

3. Claims 1-11 are objected to because of the following informalities: in claims 1-11, the term "characterised" should be changed to "characterized" in all instances. In claims 2 and 3, 2<sup>nd</sup> line of both claims, either "(13)" should be added after "tube", or this symbol be deleted. In claim 11, 4<sup>th</sup> line, "a" should be added before "circle". Appropriate correction is required.

### ***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re*

Art Unit: 1725

*Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-11 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of copending Application No. 10/013,662 (analogous to US 2002/0085969).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed reactor includes an outer shell of substantially cylindrical shape; at least one catalytic bed provided in the shell and comprising opposed perforated side walls; at least one tube passing through the at least one catalytic bed for passage of a cooling or heating fluid (serving as a heat exchanger); and a plurality of tubes arranged in at least one catalytic bed at a variable distance between adjacent tubes and are overlaid and connected at respective free ends at a duct, such that the at least one tube extends as a coil, preferably in the shape of a spiral, with the spiral having a winding pitch that varies as the radius of the spiral varies. One of ordinary skill in the art would have recognized that the structural features that include a coil/spiral with a winding pitch that varies as the spiral radius varies would form a cone shaped helicoidal, rather than a cylindrical helicoidal structure, and it would have been

Art Unit: 1725

obvious to include one or more of the tubes that extend along a plane substantially perpendicular to the side walls, since the inwardly spiraling arrangement of tubes are substantially perpendicular to the reactor shell walls, for the purpose of extending the heat exchange to cover nearly the entire width of the reactor shell, thus obtaining improved cooling.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claims 1-11 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3, 4, 6, and 10 of copending Application No. 10/009,773. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed reactor includes an outer shell of substantially cylindrical shape; at least one catalytic bed provided in the shell and comprising opposed perforated side walls; at least one tube passing through the at least one catalytic bed for passage of a cooling or heating fluid (serving as a heat exchanger); and a plurality of tubes arranged in at least one catalytic bed at a variable distance between adjacent tubes and are overlaid and connected at respective free ends at a duct, such that the at least one tube extends as a spiral, coil, or alike wrapping around a portion of the side wall (serving as a modular unit in the embodiment of at least two tubes wrapping around a portion of the side wall). One of ordinary skill in the art would have recognized that the structural features that include a spiral, coil, or alike wrapping around a portion of the side wall

Art Unit: 1725

would form a cone shaped helicoidal or a cylindrical helicoidal structure, depending on the shape of the outer shell of the reactor, which is known in the art to be cylindrical and conical, and it would have been obvious to include one or more of the tubes that extend along a plane substantially perpendicular to the side walls, since the inwardly spiraling arrangement of tubes are substantially perpendicular to the reactor shell walls, for the purpose of extending the heat exchange to cover nearly the entire width of the reactor shell, thus obtaining improved cooling.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "said spiral-shaped coil". There is insufficient antecedent basis for this limitation in the claim, since the optional limitation "preferably in the form of a spiral" exists in claim 3, from which claim 4 is dependent.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-6 insofar as definite (in view of the lack of a translation of the German document) are rejected under 35 U.S.C. 102(b) as being anticipated by Marold et al. (DE 37 08 957).

Marold et al. disclose an internally cooled catalyst bed reactor, in which the reactor includes a vertical outer cylindrical shell 2; a catalyst bed 6 within the shell 2, such that the shell 2 contains perforations (3,5,9) in the opposed sides walls that include helical pipes 7; a central duct and a plurality of connecting ducts; and tubes extending in a concentric arrangement in the form of a spiral-shaped coil (of decreasing winding pitch as the spiral radius increases) through the catalyst bed for passage of heating/cooling fluid, with some of the tubes extending along a horizontal plane that is substantially perpendicular to the side walls (abstract; and Figures 1-4).

11. Claims 1-3 insofar as definite (in view of the lack of a translation of the German document) are rejected under 35 U.S.C. 102(b) as being anticipated by Ruppel et al. (EP 0 534 195).

Ruppel et al. disclose an internally cooled catalyst bed reactor, in which the reactor includes a vertical outer cylindrical shell; a catalyst bed 1 within the shell, such that the shell contains perforations in the opposed sides walls that include helical pipes 3; a central duct and a plurality of connecting ducts; and tubes extending in the form of a spiral-shaped coil through the catalyst bed for passage of heating/cooling fluid, with some of the tubes extending along a horizontal plane that is substantially perpendicular to the side walls (abstract; and Figures 1 and 2).

12. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Groombridge (GB 391 444).

Groombridge discloses a reactor that includes a vertical outer cylindrical shell 1; a catalyst bed 2 within the shell 1, such that the shell 1 contains perforations 18 in the opposed sides walls of pipes 10 that correspond to reactant inlets (13,15) and reaction product outlet 17; and inner and outer tubes (4,5) extending in a concentric arrangement at a variable distance throughout the catalyst bed 2 for passage of heating/cooling fluid 6,7,8,9 (page 2, lines 71-112; page 3, lines 94-130; page 4, lines 1-33; and Figures 1 and 2).

13. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Mehta et al. (US 3,663,179).

Mehta et al. disclose a reactor apparatus, in which the reactor has a vertical outer cylindrical shell 5; a catalyst bed 14 within the shell 5, such that the



Art Unit: 1725

shell 5 contains perforations in the opposed sides walls of pipes 17 that correspond to reactant inlets and reaction product outlets; a plurality of connecting ducts; and several tubes extending in a concentric arrangement through the catalyst bed for passage of heating/cooling fluid, with some of the tubes extending along a horizontal plane that is substantially perpendicular to the side walls (abstract; column 1, lines 25-75; column 2, lines 11-75; column 3, lines 1-71; column 4, lines 1-13; and Figures 1-3).

14. Claims 1 and 2 insofar as definite (in view of the lack of a translation of the Austrian document) are rejected under 35 U.S.C. 102(b) as being anticipated by Schober (AT 362 397).

Schober discloses a reactor, in which the reactor includes a vertical outer cylindrical shell 1; a catalyst bed 8 within the shell, such that the shell contains perforations in the opposed sides walls of pipes that correspond to reactant inlets and reaction product outlets; a plurality of connecting ducts; and several tubes extending in a concentric arrangement through the catalyst bed for passage of heating/cooling fluid, with some of the tubes extending along a horizontal plane that is substantially perpendicular to the side walls (page 5, lines 23-35 of the Austrian document -- see International Search Report; and Figures 7 and 8).

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1725

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of Marold et al. (DE 37 08 957), Ruppel et al. (EP 0 534 195), Groombridge (GB 391 444), Mehta et al. (US 3,663,179), or Schober (AT 362 397) in view of Lahne et al. (US 4,339,413).

Marold et al., Ruppel et al., Groombridge, Mehta et al., and Schober individually disclose the features of claim 1 above. Neither Marold et al., Ruppel et al., Groombridge, Mehta et al., nor Schober discloses the plurality of tubes overlaid (side-by-side) with each other and connected at respective free ends.

However, Lahne et al. disclose a methanol-synthesis reactor, in which the reactor includes a vertical outer cylindrical shell 2; a catalyst bed 4 within the

Art Unit: 1725

shell; and an array 5 of helical tubes extending in a concentric arrangement with overlaid (side-by-side --see Figure 6) tube layers (21,22) through the catalyst bed 4 for passage of heating/cooling fluid, with the plurality of helical tubes connecting to a common manifold 8a via tube sections (23,24) and extending along a horizontal plane that is substantially perpendicular to the side walls, such that the overlaid (side-by-side) plurality of helical tubes is advantageous for obtaining a substantially uniform temperature distribution throughout the catalyst bed (abstract; column 1, lines 67-68; column 2, lines 1-68; column 3, lines 1-45; column 4, lines 3-68; column 5, lines 1-31; and Figures 1-6).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify any of the reactors disclosed by any one of Marold et al., Ruppel et al., Groombridge, Mehta et al., or Schober, by adding the array of helical tubes extending in a concentric arrangement with overlaid (side-by-side) tube layers that connect to a common manifold via corresponding tube sections, as taught by Lahne et al., in order to obtain a substantially uniform temperature distribution throughout the catalyst bed (Lahne et al.; column 3, lines 8-31; and column 4, lines 28-31).

### ***Conclusion***

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Houdry, Zanma et al., Jezl et al., and GB 2 204 055 references are also cited in PTO-892.

Art Unit: 1725

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns *Kevin Kerns 8/24/04*  
Examiner  
Art Unit 1725

*KPK*  
kpk  
August 24, 2004